

What is claimed is:

1. A method for determining wear in a machine comprising:

- 5 a. providing a first material of a first color;
- b. providing a second material of a second color;
- c. melting the first and second materials in the machine to obtain a third material of a third color;
- 10 d. obtaining the color of the third color to obtain a first color value;
- e. obtaining a comparison of the first color value with a second color value, a difference between the first color value and the second color value
- 15 indicates wear in the machine.

2. The method as in claim 1 wherein the second color value is obtained from a color chip.

20 3. The method as in claim 1 wherein the second color value is obtained from a control part.

25 4. The method as in claim 1 wherein the second color value is obtained from a predetermined line on a graph.

 5. The method as in claim 1 wherein the second color value is obtained from a predetermined mathematical equation.

30 6. The method as in claim 1 wherein the machine has a screw and a barrel which are separated by a distance, the difference between the first color value and the second color value indicates a change in the distance and wear in the machine.

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7. The method as in claim 1 further comprising:
repeating steps a-c after a specified period of time and
obtaining the color of the third color to obtain a second
color value.

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8. The method as in claim 7 further comprising the
step of creating a graph with color value on one axis and
time on the other axis, placing the first color value and
second color value on the graph and forming a line with
the values.

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9. The method as in claim 8 further comprising the
step of extrapolating the line beyond the values to
determine the time when the color value will reach a
predetermined value.

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10. The method as in claim 7 further comprising the
step of repeating steps a-c after a second specified
period of time and obtaining the color of the third color
to obtain a third color value.

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11. The method as in claim 10 further comprising
the step of repeating steps a-c after a third specified
period of time and measuring the color of the fourth
color to obtain a fourth color value.

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12. The method as in claim 10 further comprising
the step of creating a graph with color value on one axis
and time on the other axis, placing the color values on
the graph and forming a line with the values.

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13. The method as in claim 12 further comprising
the step of extrapolating the line beyond the values to
determine the time when the color value will reach a
predetermined value.

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14. The method as in claim 7 further comprising creating a mathematical equation which represents the relationship between the values and the time period.

5 15. The method as in claim 14 wherein the equation is used to determine the time when the color value will reach a predetermined value.

10 16. The method as in claim 1 wherein the first material is in pellet form and the second material is in pellet form.

15 17. The method as in claim 16 wherein the first material and second material are premixed.

18. The method as in claim 1 wherein the first material is in pellet form and the second material is in liquid form.

20 19. The method as in claim 1 wherein the first material is a precolored compound and the second material is a color concentrate.

25 20. The method as in claim 19 wherein the first color is yellow, the second color is blue and the third color is green.

30 21. The method as in claim 19 wherein the first color is white, the second color is blue and the third color is light blue.

35 22. The method as in claim 1 wherein the first material is a natural resin and the second material is a color concentrate.

23. The method as in claim 1 wherein the first material is a natural resin and the second material is a colorant.

5 24. The method as in claim 23 wherein the colorant is selected from the group consisting of: a pigment, a dye, and a combination of a pigment and a dye.

10 25. The method as in claim 1 wherein the machine is an extruder.

26. The method as in claim 1 wherein the machine is an injection molding machine.

15 27. The method as in claim 1 wherein the third material is molded into a part.

20 28. The method as in claim 27 wherein the step of obtaining the color is performed on the part.

29. The method as in claim 1 wherein step d is performed using a measuring device.

25 30. The method as in claim 29 wherein the measuring device is a spectrophotometer.

30 31. The invention as in claim 4 wherein the predetermined line is obtained by measuring the color of the third material at various intervals of time.

32. The invention as in claim 4 wherein the predetermined line corresponds to the abrasiveness of the first material or the second material.

33. The invention as in claim 32 wherein a second predetermined line corresponds to the abrasiveness of a different first material or second material.

5 34. The invention as in claim 5 wherein the predetermined equation is obtained by measuring the color of the third material at various intervals of time.

10 35. The invention as in claim 5 wherein the predetermined equation corresponds to the abrasiveness of the first material or the second material.

15 36. The invention as in claim 35 wherein a second predetermined equation corresponds to the abrasiveness of a different first material or second material.

37. A method for determining wear in a machine comprising:

- 20 a. providing a first material of a first color;
b. providing a second material of a second color;
c. melting the first and second materials in the machine to obtain a third material of a third color;
25 d. forming the third material into a part;
e. obtaining the color of the third color at a first location on the part to obtain a first color value and obtaining the color of the third color at a second location on the part to obtain a second color value;
30 f. obtaining a comparison of the first color value with the second color value.

38. The method as in claim 37 wherein the machine has a screw and a barrel which are separated by a
35 distance, the difference between the first color value

and the second color value indicates a change in the distance and wear in the machine.

39. The method as in claim 37 wherein the first
5 material is in pellet form and the second material is in pellet form.

40. The method as in claim 39 wherein the first
10 material and second material are premixed.

41. The method as in claim 37 wherein the first
material is in pellet form and the second material is in
liquid form.

42. The method as in claim 37 wherein the first
15 color is yellow, the second color is blue and the third color is green.

43. The method as in claim 37 wherein the machine
20 is an extrusion molding machine.

44. The method as in claim 37 wherein the machine
is an injection molding machine.

45. The method as in claim 37 wherein the third
25 material is molded into a part.

46. The method as in claim 37 wherein step e is
performed using a measuring device.

47. The method as in claim 46 wherein the measuring
30 device is a spectrophotometer.

48. A method for determining wear in a machine
35 comprising:

a. providing a first material of a first color;

- b. providing a second material of a second color, which will be melted with the first material in the machine to obtain a third material of a third color;
- 5 c. obtaining the color of the third color to obtain a first color value;
- d. obtaining a comparison of the first color value with a second color value, a difference between the first color value and the second color value
- 10 indicates wear in the machine.

50. A method for determining wear in a machine using a first material of a first color and a second material of a second color which are melted in the

15 machine to obtain a third material of a third color, the method comprising:

- a. at a first period of time, obtaining a first sample of the third material and measuring the color of the third color to obtain a first color
- 20 value;
- b. obtaining a comparison of the first color value with a second color value, a difference between the first color value and the second color value
- 25 indicates wear in the machine.